Recovery Plan Action Status

Plan Name: Recovery Plan for the Shasta Crayfish (Pacifastacus fortis)

Plan Status: Final Plan Date: 28-Aug-98 Lead Agency: USFWS

Lead Office: Sacramento Fish And Wildlife Office 414-6600)

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Shasta crayfish (Pacifastacus fortis)	1	1.1.1	Upper Fall River: Work with landowners	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.1.2	Upper Fall River: Install barrier above Navigation Limit	Complete	FY 1995 - FY 1999	FY 2007	U.S. Fish and Wildlife Service, California Department of Fish and Game, Natural Resources Conservation Service	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.1.3	Upper Fall River: Restore Bear Creek Meadow	Complete	FY 1995 - FY 1999	FY 2000 - FY 2004	Central Valley Regional Water Quality Control Board, Shasta County, California, California Department of Fish and Game, U.S. Army Corps of Engineers, Natural Resources Conservation Service	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.1.4	Upper Fall River: Enhance habitat	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.2.1	Spring Creek: Work with landowners	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game, Natural Resources Conservation Service	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.2.2	Spring Creek: Eradicate signal crayfish upstream of culverts	Ongoing Current	FY 1995 - FY 1999		California Department of Fish and Game	Management: Predator and Competitor Control	Contract	

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Shasta crayfish (Pacifastacus fortis)	1	1.2.3	Spring Creek: Monitor and maintain culverts at Spring Creek Road crossing as barriers	Ongoing Current	FY 1995 - FY 1999		Shasta County, California, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	2	1.2.4	Spring Creek: Enhance habitat in lower fish trap cove	Complete	FY 1995 - FY 1999	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.3.1	Lava Creek: work with landowners	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game, Natural Resources Conservation Service	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.3.2.1	Lava Creek: Survey Lava Creek for signal crayfish	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.3.2.2	Lava Creek: install barrier in east and west arms	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	2	1.3.2.3	Lava Creek: Install barrier at outflow of Lava Creek	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	1	1.3.2.4	Lava Creek: Eradicate signal crayfish upstream of barrier	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	1	1.4.1	Upper Tule River: Work with landowners	Ongoing Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game, Natural Resources Conservation Service	Work type not yet selected	Labor type not yet selected	

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Shasta crayfish (Pacifastacus fortis)	3	1.4.2	Upper Tule River: Assess/install crayfish barrier at Big Lake outflow near Rat Farm	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Army Corps of Engineers	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	1	1.4.3	Upper Tule River: Install barrier at Ja- She Creek bridge	Discontinued	FY 1995 - FY 1999		California Department of Parks and Recreation, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	3	1.4.4.1	Upper Tule River: Assess feasibility of barrier at Crystal Cove/Crystal Inlet	Discontinued	FY 1995 - FY 1999		California Department of Parks and Recreation, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	3	1.4.4.2	Upper Tule River: Install barrier if feasible at Crystal Cove/Crystal Inlet	Discontinued	FY 1995 - FY 1999		California Department of Parks and Recreation, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	1	1.4.5	Upper Tule River: Eradicate signal crayfish	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	2	1.4.6	Upper Tule River: Develop alternatives to dredging to maintain levees	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999	Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Army Corps of Engineers	Research: Habitat Requirements	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	2	1.4.7	Upper Tule River: Enhance and create habitat in Big Lake and Horr Pond	Discontinued	FY 1995 - FY 1999		Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.

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Shasta crayfish (Pacifastacus fortis)	3	1.4.8	Upper Tule River: Use native plants to stabilize banks and levees	Ongoing Current	FY 1995 - FY 1999		Pacific Gas and Electric Company, California Department of Fish and Game, U.S. Army Corps of Engineers	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.5.1	Rising River: Work with landowners	Ongoing Current	FY 2007		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.5.2	Rising River: Install barrier at Cassel bridge	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.6.1	Pit River and Sucker Springs Creek: Work with landowners	Ongoing Current	FY 1995 - FY 1999		Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.6.2	Pit River and Sucker Springs Creek: Maintain all weirs between ponds	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Removed weirs at Ponds 2 and 3.
Shasta crayfish (Pacifastacus fortis)	1	1.6.3.1	Pit River and Sucker Springs Creek: Restore Ponds 1 and 2	Ongoing Current	FY 2000 - FY 2004		Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.6.3.2	Pit River and Sucker Springs Creek: Remove Shasta crayfish from Pond 2	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	
Shasta crayfish (Pacifastacus fortis)	1	1.6.3.3	Pit River and Sucker Springs Creek: Relocate Shasta crayfish from Pond 3 to Pond 2	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Reintroduction	Contract	
Shasta crayfish (Pacifastacus fortis)	2	1.6.4	Pit River at Sucker Springs Creek: Eradicate signal crayfish in Ponds 3 and 4	Ongoing Current	FY 2000 - FY 2004	_	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	

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Shasta crayfish (Pacifastacus fortis)	2	1.6.5	Pit River at Sucker Springs Creek: Restore habitat in Pond 3	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	2	1.6.6	Pit River at Sucker Springs Creek: Install barrier at mouth of Sucker Springs Creek	Obsolete			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Repaair or replace pond five weir will be the new barrier.
Shasta crayfish (Pacifastacus fortis)	2	1.6.7	Pit River at Sucker Springs Creek: Eradicate signal crayfish below Pond 3	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	
Shasta crayfish (Pacifastacus fortis)	3	1.6.8	Pit River at Sucker Springs Creek: Evaluate Ponds 1,2,3 and remove barriers, if appropriate	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Habitat Status	Contract	
Shasta crayfish (Pacifastacus fortis)	3	1.7.1	Pit River at Sucker Springs Creek: Remove upstream dam and culvert	Complete	FY 2000 - FY 2004	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	3	1.7.2	Pit River at Sucker Springs Creek: Remove upstream sediment	Complete	FY 1995 - FY 1999	FY 2007	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Flow of river and removal of head dam allows sediment to naturally be removed.
Shasta crayfish (Pacifastacus fortis)	3	1.7.3	Pit River at Sucker Springs Creek: Add lava substrate upstream, if needed	Obsolete	FY 1995 - FY 1999	FY 2007	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Too shallow for SC habitat.
Shasta crayfish (Pacifastacus fortis)	1	2.1.1	Hat Creek, Cassel: Work with landowners	Ongoing Current	FY 1995 - FY 1999		Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game, Natural Resources Conservation Service	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	3	2.1.2	Hat Creek, Cassel: Install barrier at Crystal Lake outflow into Baum Lake	Obsolete		FY 2007	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	

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Shasta crayfish (Pacifastacus fortis)	3	2.1.3	Hat Creek, Cassel: Eradicate signal crayfish in Crystal Lake	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	
Shasta crayfish (Pacifastacus fortis)	2	2.1.4.1	Hat Creek, Cassel: Install cattle exclusion fences	Discontinued	FY 1995 - FY 1999	FY 2000 - FY 2004	Pacific Gas and Electric Company, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Grazing management stopped by PGE in 2002.
Shasta crayfish (Pacifastacus fortis)	2	2.1.4.2	Hat Creek, Cassel: Develop protection zones around lakes	Ongoing Current	FY 1995 - FY 1999		Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	2	2.1.5	Hat Creek, Cassel: Restrict fishing at outflow	Complete	FY 1995 - FY 1999	FY 2000 - FY 2004	California Department of Fish and Game	Other: Regulations	Internal Field Assistance	Maria
Shasta crayfish (Pacifastacus fortis)	2	2.2.1	Upper Tule River: Install barriers at east and west Tule Cove entrances	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	2	2.2.2	Upper Tule River: Eradicate signal crayfish at coves	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	Signal Crayfish abundance precludes continuation.
Shasta crayfish (Pacifastacus fortis)	2	2.2.3	Upper Tule River: Enhance habitat along upper Tule River	Not Started			Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	3	2.2.4	Control Tule River muskrat population	Ongoing Current	FY 2000 - FY 2004		California Department of Fish and Game, Natural Resources Conservation Service	Management: Predator and Competitor Control	Contract	
Shasta crayfish (Pacifastacus fortis)	2	2.3.1	Pit River: Work with landowners	Ongoing Current	FY 1995 - FY 1999		Pacific Gas and Electric Company, Shasta County, California, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Natural Resources Conservation Service	Management: General	Contract	

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Shasta crayfish (Pacifastacus fortis)	2	2.3.2	Pit River: Survey for Shasta Crayfish	Complete	FY 2000 - FY 2004	FY 2005	U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Contract	
Shasta crayfish (Pacifastacus fortis)	2	2.3.3	Pit River: Restore water release	Complete	FY 2000 - FY 2004	FY 2000 - FY 2004	Central Valley Regional Water Quality Control Board, Pacific Gas and Electric Company, U.S. Fish and Wildlife Service, California Department of Fish and Game	Work type not yet selected	Labor type not yet selected	
Shasta crayfish (Pacifastacus fortis)	2	2.4.1	Upper Fall River: Develop management/restor ation plans	Ongoing Current	FY 2000 - FY 2004		Central Valley Regional Water Quality Control Board, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Army Corps of Engineers, Natural Resources Conservation Service	Management: Planning	Contract	
Shasta crayfish (Pacifastacus fortis)	2	2.4.2	Upper Fall River: Enhance habitat	Obsolete			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	2	2.4.3	Upper Fall River: Develop plan for site-exclusion barriers	Obsolete	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Shasta Crayfish not found in area.
Shasta crayfish (Pacifastacus fortis)	2	2.4.4	Upper Fall River: Eradicate signal crayfish upstream of barriers	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	No Shasta Crayfish at this site any longer.
Shasta crayfish (Pacifastacus fortis)	2	2.4.5	Upper Fall River: Collaborate on restoration with private organizations	Ongoing Current	FY 1995 - FY 1999		Central Valley Regional Water Quality Control Board, California Department of Fish and Game, Natural Resources Conservation Service	Management: Planning	Contract	

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Shasta crayfish (Pacifastacus fortis)	1	3.1	Design and conduct flume studies	Complete	FY 1995 - FY 1999	FY 2005	U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Other Information	Contract	
Shasta crayfish (Pacifastacus fortis)	1	3.2	Determine and protect recharge area for Fall River	Discontinued	FY 1995 - FY 1999	FY 2005	Pacific Gas and Electric Company	Research: Other Information	Contract	
Shasta crayfish (Pacifastacus fortis)	2	3.3	Pit River: Estimate population densities and establish recovery targets	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Contract	
Shasta crayfish (Pacifastacus fortis)	2	3.4.1	Pit River: Study diet and nutrition of Shasta crayfish	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Other Information	Contract	
Shasta crayfish (Pacifastacus fortis)	2	3.4.2.1	Pit River: Determine effects of signal crayfish competition and predation	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999	U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Competition	Contract	
Shasta crayfish (Pacifastacus fortis)	2	3.4.2.2	Pit River: Determine effects of signal crayfish on reproduction	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Propagation	Contract	
Shasta crayfish (Pacifastacus fortis)	2	3.4.2.3	Pit River: Determine impact of pathogens from signal crayfish	Unknown			U.S. Fish and Wildlife Service, California Department of Fish and Game	Work type not yet selected	Labor type not yet selected	
Shasta crayfish (Pacifastacus fortis)	2	3.4.2.4	Pit River: Determine effects of incidental secondary invaders from signal crayfish	Complete	Prior to FY 1995	FY 1995 - FY 1999	U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Competition	Contract	
Shasta crayfish (Pacifastacus fortis)	3	3.4.3.1	Pit River: Determine effects of virile crayfish on competition and predation	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Disease	Contract	
Shasta crayfish (Pacifastacus fortis)	3	3.4.3.2	Pit River: Determine effects of virile crayfish on reproduction	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Propagation	Contract	
Shasta crayfish (Pacifastacus fortis)	3	3.4.3.3	Pit River: Determine impact of pathogens from virile crayfish	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Disease	Contract	

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Shasta crayfish (Pacifastacus fortis)	3	3.4.3.4	Pit River: Determine effects of incidental secondary invaders from virile crayfish	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Disease	Contract	
Shasta crayfish (Pacifastacus fortis)	3	3.5	Study genetics	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Genetics	Contract	
Shasta crayfish (Pacifastacus fortis)	2	4.1	Monitor success of signal crayfish eradication	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Propagation	Contract	
Shasta crayfish (Pacifastacus fortis)	2	4.2	Monitor status of Shasta crayfish	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Contract	
Shasta crayfish (Pacifastacus fortis)	1	4.3	Monitor crayfish barriers	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Shasta crayfish (Pacifastacus fortis)	3	5.1	Work with landowners	Ongoing Current	FY 1995 - FY 1999		Central Valley Regional Water Quality Control Board, California Department of Fish and Game, Natural Resources Conservation Service	Management: General	Contract	
Shasta crayfish (Pacifastacus fortis)	3	5.2.1	Change crayfishing regulations	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999	California Department of Fish and Game	Other: Regulations	Contract	
Shasta crayfish (Pacifastacus fortis)	2	5.2.2	Enforce bait restrictions	Ongoing Current	FY 1995 - FY 1999		California Department of Fish and Game	Other: Law Enforcement	Contract	
Shasta crayfish (Pacifastacus fortis)	3	5.2.3	Enforce prohibitions on introductions of exotic species	Ongoing Current	FY 1995 - FY 1999		California Department of Fish and Game	Other: Law Enforcement	Contract	
Shasta crayfish (Pacifastacus fortis)	3	5.3.1	Update irrigation systems to improve water quality	Not Started			Central Valley Regional Water Quality Control Board	Research	Contract	
Shasta crayfish (Pacifastacus fortis)	3	5.3.2	Explore effects of agricultural chemicals	Not Started			Central Valley Regional Water Quality Control Board	Research: Environmental Contaminants	Contract	

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Shasta crayfish (Pacifastacus fortis)	3	6.1	Post signs at boat accesses and public use areas	Complete	FY 1995 - FY 1999	FY 2005	California Department of Fish and Game		Contract	
Shasta crayfish (Pacifastacus fortis)	3	6.2	Write newspaper articles	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Other: Information and Education	Contract	
Shasta crayfish (Pacifastacus fortis)	3	6.3	Make public school presentations	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Other: Information and Education	Contract	
Shasta crayfish (Pacifastacus fortis)	3	6.4	Provide information at Ahjumawi Lava Springs State Park	Ongoing Current	FY 1995 - FY 1999		California Department of Parks and Recreation	Other: Law Enforcement	Contract	